

**APPENDIX A:**

**SANDIA NATIONAL LABORATORIES, LIVERMORE,  
CONTRIBUTION TO THE SUPPLEMENT ANALYSIS**

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## **APPENDIX A:**

### **SANDIA NATIONAL LABORATORIES, LIVERMORE, CONTRIBUTION TO THE SUPPLEMENT ANALYSIS**

#### **A.1 INTRODUCTION**

This appendix presents the changes from the 1992 EIS/EIR at Sandia National Laboratories, Livermore (SNL), by resource area and evaluates the significance of any increased impacts.

#### **A.2 MISSION**

As a U.S. Department of Energy (DOE) national laboratory, Sandia National Laboratories (both New Mexico and California) works in partnership with universities and industry to enhance the security, prosperity, and well being of the nation. Sandia National Laboratories provides scientific and engineering solutions to meet national needs in nuclear weapons and related defense systems, energy security, and environmental integrity, and to address emerging national challenges for both government and industry. The basic mission for SNL, Livermore, has not changed. Three broad programmatic areas for SNL, Livermore are national security, energy research, and integrated manufacturing technologies. National security programs include nonproliferation and counterproliferation. Emphasis has been added to SNL, Livermore, for energy research in combustion science and technology and for integrated manufacturing technologies.

As described in the 1992 EIS/EIR, the SNL mission is engineering research and development for all levels and phases of the nuclear-weapons life cycle; tasks related to national security, including nuclear materials safeguards and security, treaty verification and control, intelligence on foreign technologies and weapons systems, waste management, and programs in support of the DOD; and basic and applied research and development for national energy programs. This mission has not changed and no significant new programs or projects have been proposed since 1992 or are planned for SNL for the near future (2002). In fact, DOE has phased out the operation of the Tritium Research Laboratory (TRL) and completed its decontamination in 1996.

#### **A.3 IMPACTS**

Table A.1 provides a comparison of the 1992 EIS/EIR impacts with 1996 conditions by resource area/issue. For those areas for which there is an increase or potential impact, an evaluation is provided below.

**TABLE A.1 Comparison of 1992 EIS/EIR Impacts with 1996 Conditions at SNL**

| Issue                                       | 1992 EIS/EIR  | FY 1996 Status <sup>a</sup>  | Impact                            |
|---|---|--|-----------------------------------|
| Land Use                                    | 830,000 gsf <sup>b</sup> with a projected 6% increase   | 820,000 gsf  | Decrease                          |
| Socioeconomic                               | Site population is approx. 1,500 (450 contractors)  | Site population is 1178 (965 Sandians, 213 contractors)  | Decrease                          |
| Community Services                          | 205 students enrolled in Livermore schools were from Sandia families  | 129 children of Sandians attend Livermore schools  | Decrease                          |
| Prehistoric and Historic Resources          | No impact anticipated   | No changes   | No change                         |
| Aesthetics and Scenic Resources             | Projected small site changes  | No changes   | No change                         |
| Geology                                     | No impact anticipated   | No changes   | No change                         |
| Ecology                                     |   |  |                                   |
| Vegetation                                  | No impact anticipated   | No changes   | No change                         |
| Wildlife                                    | No impact anticipated   | <ul style="list-style-type: none"> <li>• CA tiger salamander</li> <li>• Burrowing owl</li> <li>• Ferruginous hawk</li> </ul>                 | Minor change                      |
| Threatened and Endangered Species           | No impact anticipated   | No threatened or endangered species present on SNL   | No change                         |
| Wetlands                                    | No impact anticipated   | Repair to SNL's perimeter security fence could have interim impact on the wetlands, but will be mitigated                                    | Temporary change                  |
| Air Quality                                 |   |  |                                   |
| Criteria Pollutants                         | Particulates - 0.35 lb/day (+0.02)<br>VOCs - 14.1 lb/day (+0.85)<br>Sulfur oxides - 0.01 lb/day (+0.001)<br>Nitrogen oxides - 18.7 lb/day (+1.12)<br>Carbon monoxide - 2.4 lb/day (+0.14) | Particulates - 0.001 lb/day<br>VOCs - 3 lb/day<br>Sulfur oxides - 0.00 lb/day<br>Nitrogen oxides - 19 lb/day<br>Carbon monoxide - 1.0 lb/day | Decrease or essentially no change |
| Toxic Air Contaminants                      | TCE - 1,765 lb/yr (+88.3)<br>Gasoline vapors - 170 lb/yr (+8.5)<br>CFCs - 300 lb/yr (+15)   | TCE - 360 lb/yr<br>Gasoline vapors - 2 lb/yr<br>CFCs - 613 lb for 1996   | Decrease<br>Decrease<br>Increase  |
| Beryllium                                   | None  | None   | No change                         |
| Radiation                                   | Emissions decrease projected  | Total tritium emissions in 1996 were 0.078 Ci.   | Decrease                          |
| Decommissioning Tritium Research Laboratory | Short-term increase due to cleanup projected  | Tritium emissions during the cleanup period steadily decreased   | Decrease                          |
| Water                                       |   |  |                                   |
| Surface Water                               | No impact anticipated   | No changes   | No change                         |
| Groundwater                                 | No impact anticipated   | No changes   | No change                         |

**TABLE A.1 (Cont.)**

| Issue                                       | 1992 EIS/EIR  | FY 1996 Status <sup>a</sup>  | Impact  |
|---|---|--|---|
| Noise                                       | Increase impact   | No data available  | Unknown   |
| Traffic                                     | Projected increase to 3,130 vehicle trips/day   | 1,178 people x 2 trips/day = 2,356 vehicle trips/day   | Decrease  |
| Utilities and Energy                        |   |  |   |
| Water                                       | 58 million gal/yr estimate for 1992 (projected increase to 61.5 million gal/yr)   | 58 million gallons were consumed in 1996   | No change   |
| Electricity                                 | 40.1 million kilowatt-hours/yr (projected to increase to 42.5 million kW-h/yr)  | 37.4 million kW-H were used in 1996  | Decrease  |
| Fuel (gasoline and diesel)                  | 16,600 gal of fuel/yr (projected to increase to 17,600 gal/yr)  | 10,541 gal of fuel for 1996  | Decrease  |
| Sewage Discharges                           | Estimated discharge of 27.7 million gal/yr for 1992 (projected increase to 29.3 million gal/yr)   | 18.7 million gallons was discharged in 1996  | Decrease  |
| Materials and Waste Management              |   |  |   |
| Materials Management (chemicals)            | Liquid - 3,420 gal (+210 gal increase)<br>Solid - 6,320 lb (+380 lb increase)<br>Gas - 197,000 ft <sup>3</sup> (+11,900 ft <sup>3</sup> increase)       | Liquid - 49,321 gal<br>Solid - 44,770 lb<br>Gas - 377,525 ft <sup>3</sup>  | Increase  |
| Waste Management                            |   |  |   |
| Radioactive (low level)                     | 72,805 lb (+4,377 lb projected increase)  | 5,590 lb for FY1996  | Decrease  |
| Hazardous                                   | Liquid - 3,940 gal (+240 gal projected increase)<br>Solid - 6,320 lb (+380 lb projected increase)   | Liquid - 14,455 gal for FY1996<br>Solids - 96,865 lb for FY1996  | Increase  |
| Mixed                                       | liquid - 250 lb (+ 15 lb projected increase)<br>solid - 73 lb (+4 lb projected increase)  | 0 lb for FY1996  | Decrease  |
| Medical                                     | 124 lb (+ 7 lb projected increase)  | 416 lb for FY1996  | Increase  |
| Decommissioning Tritium Research Laboratory | Waste projections for cleanup and transition of TRL: 100,000 lb of low-level waste; 310 gal of mixed waste; low-level waste shipped less than 10,000 Ci | Net waste weight from TRL cleanup and transition was 103,900 lb; mixed waste generation was 323 gal; total shipped was 14,090 Ci (tritium) | Short-term increase leading to long-term decrease |
| Occupational Protection                     |   |  |   |
| Radiation                                   | Collective radiation dose to workers was 3.5 person-rem in 1990   | 505 workers were monitored in 1996 resulting in a 0.361 person-rem dose  | Decrease  |

**TABLE A.1 (Cont.)**

| Issue                                       | 1992 EIS/EIR   | FY 1996 Status <sup>a</sup>   | Impact            |
|---|--|---|-------------------|
| Decommissioning Tritium Research Laboratory | 2 to 3.3 person-rem/yr for 3 years   | Total exposure for all individuals for the 3 years was 0.58 person-rem  | Decrease          |
| Toxic Substances and Physical Hazards       | For the 5-year period 1986-1990 there were 133 accidents recorded:<br>27% (36 cases) lacerations<br>21% (28 cases) backpain or strains | For the 5 year period 1992-1996 there were 194 injuries:<br>40% (77 cases) repetitive trauma<br>18% (34 cases) strains<br>12% (24 cases) backpain or strain | Increase          |
| Site Contamination                          | Low  | CCl <sub>4</sub> identified in monitoring well NLF-6  | Possible increase |

<sup>a</sup> Sources for 1996 data were EH&S databases and personal communications from EH&S program managers.

<sup>b</sup> gsf = gross square feet.

### A.3.1 Wildlife

Over the past two years, there have been several sightings on SNL property of wildlife classified as federal candidate species and/or California state “species of special concern.” These species include the California tiger salamander, the ferruginous hawk, and the burrowing owl. California tiger salamanders were sighted at the southern boundary, near the Lawrence Livermore National Laboratories (LLNL) water tanks, and in the western buffer zone near the LLNL percolation ponds. Burrowing owls were also sighted near the LLNL percolation ponds. The ferruginous hawk was sighted in SNL’s eastern buffer zone.

In July 1998, a biological survey was conducted at SNL (SNL 1998). The western buffer area was found to contain suitable habitat for California tiger salamanders, burrowing owls, and loggerhead shrikes, a California state “species of special concern.” Several loggerhead shrikes were also observed on fences throughout the SNL property. Loggerhead shrikes are likely to nest in the riparian corridor in the eastern buffer and in the scrubby habitat south of the water tanks.

At the time the 1992 EIS/EIR was prepared, no sensitive species were present on the SNL site. If other than routine activities are planned that may impact sensitive species, then additional NEPA analysis will be conducted. Current site practice is to minimize disturbance to all wildlife species, even sensitive species for which there are no regulatory requirements.

### **A.3.2 Wetlands**

Projects to repair SNL's perimeter security fence and to conduct maintenance of a trash rack located within the Arroyo Seco will be conducted within a wetland. The repairs will consist of improving the stream channel at the fence crossing by cementing and placement of rip-rap. Maintenance would consist of removing debris and sediment that has formed a dam across the arroyo. Any wetlands that are disturbed during these projects will be restored in accordance with regulatory permits and agreements, resulting in no net loss of wetland area.

### **A.3.3 Air Quality**

It was not until June 14, 1993, that Section 8 of the amendments to the Clean Air Act of 1990 required service records be kept on equipment containing more than 50 lb of ozone depleting substances (ODSs), as well as the quantity of refrigerant added. Before that time, there was no formal tracking of the amount of refrigerant used at SNL. Since tracking records did not exist in 1992, purchase orders were used to calculate the 300-lb usage of chlorofluorocarbons (CFCs) in 1992. Data from 1996 show an increase of 313 lb of CFCs used over the usage reported in the EIS/EIR. This increase is likely a result of the change in tracking requirements and implementation of a tracking system rather than an actual increase in the amount used.

As part of planned activities described in the 1992 EIS/EIR, SNL committed to reducing the tritium limit to 0 g and to decontaminate and decommission the TRL. In 1993, SNL initiated an in-house cleanup and transition project for the TRL. The 0 g tritium limit was reached on October 18, 1994. Final cleanup and transition of the facility was completed in 1996. The facility has since been reclassified as a non-nuclear, low-hazard facility and is currently used for bench-scale chemical and radiation detector research and development activities. Transition of the TRL has resulted in an appreciable decrease of radiological emissions to the environment from SNL operations.

### **A.3.4 Noise**

An increase in noise was identified in the 1992 EIS/EIR because of planned construction and infrastructure upgrade projects. Infrastructure upgrade projects have been completed. The two construction projects that were proposed in the EIS/EIR were not implemented, and there are no current plans to move forward with these projects. Because operations have remained steady between 1992 and 1997 and no new facility construction projects were initiated, no additional sitewide noise surveys were conducted.

### **A.3.5 Materials Management (chemicals)**

The chemical inventory data supplied from the line in 1992 was collected through a voluntary process much different than the mandatory bar-coded container tracking process used today. The 1992 inventory also focused on classic research chemicals. The current chemical inventory is far more comprehensive, including not only research chemicals but also janitorial supplies, paints, maintenance chemicals (fuel oil and gasoline), and all gases (liquid nitrogen and liquid argon) on the site. Although the 1996 data show an increase in quantities of chemicals on-site, these differences are likely due to changes in chemical inventory tracking and implementation of a comprehensive tracking system. It is expected that inventories will slowly reduce as on-site chemical users are educated on the importance of reducing their inventories. Improvement in the just-in-time chemical purchasing and a comprehensive chemical inventory system will also help to reduce inventories.

### **A.3.6 Waste Management (hazardous)**

The amount of liquid hazardous waste generated in FY 1996 is considerably more than the amount presented in the 1992 EIS/EIR. This increase is due primarily to the nonroutine cleaning of the Liquid Effluent Containment System (LECS) at Building 913. The cleaning of the 913 LECS resulted in the one-time generation of 6,750 gallons of lead-contaminated wastewater that was disposed of as hazardous waste. Data for 1996 also show an increase in solid hazardous waste generated. This is most likely due to the following categories of waste, totaling 74,176 lb, included in 1996 data but not in the 1992 EIS/EIR data:

- Waste generated from asbestos projects,
- Used empty drums,
- Waste resulting from the dismantling of the incinerator,
- Batteries, and
- Mercury.

### **A.3.7 Medical Waste**

The increase in medical waste was due to a nonroutine sewerline cleanout project. Some of this waste was disposed of as “medical” waste because of the potential biohazard component. Routine medical waste quantities were believed to be approximately the same.



### A.3.8 Waste Transportation

Impacts associated with transportation of waste off-site from SNL from the 1992 EIS/EIR have not changed. Although the quantity of waste generated is higher than that stated in the EIS/EIR, the transportation impacts are lower. The 1992 EIS/EIR analyzed six shipments per month, while the site presently ships, on average, less than three times per month.

### A.3.9 Physical Hazards

The increase in injuries seen for the years 1992 through 1996 appears to be due to an increase in one specific injury category: repetitive trauma. Reportable cases of this type of injury have gone from 1 for the period of 1986–1990 to 77 cases for the period 1992–1996. Most likely this increase does not represent an actual increase in the number of repetitive trauma injuries occurring, but rather, an increase in the number of repetitive trauma injuries that are being *reported* due to an increased awareness of these types of injuries on the part of employees and SNL management.

### A.3.10 Site Contamination

As part of planned activities described in the 1992 EIS/EIR, SNL committed to reducing the tritium limit to 0 g and to decontaminate and decommission the TRL. In 1993, SNL initiated an in-house cleanup and transition project for the TRL. The 0 g tritium limit was reached on October 18, 1994. Final cleanup and transition of the facility was completed in 1996. The facility has since been reclassified as a non-nuclear, low-hazard facility and is currently used for bench-scale chemical and radiation detector research and development activities. Transition of the TRL has resulted in an appreciable decrease of radiological emissions to the environment from SNL operations.

As part of the Navy Landfill investigations in 1993, groundwater monitoring wells were drilled outside the boundary of the landfill. One of these monitoring wells, NLF-6 located to the east of the landfill, has shown carbon tetrachloride to be present at levels ranging from nondetectable (detection level is 0.5 ppb) to 2.3 ppb. These concentrations are above the California maximum contaminant level (MCL) of 0.5 ppb. It seems unlikely that the source of the carbon tetrachloride in NLF-6 is the landfill. First, NLF-6 is located outside of the NLF perimeter and is cross-gradient to the general groundwater flow direction beneath the NLF. In fact, the potentiometric contours indicate that NLF-6 could very likely be in a groundwater zone of stagnation (i.e., a point in the groundwater flow field where groundwater is not moving). Therefore, it would be highly unlikely that groundwater would flow from the landfill toward NLF-6. Secondly, there is no historical information indicating that chlorinated hydrocarbons were disposed of in the NLF. In fact, with this one exception, over 10 years of quarterly monitoring has shown all wells associated with the NLF to be free of any chlorinated

hydrocarbons. Finally, the levels of carbon tetrachloride in NLF-6 have remained at a low, constant level for nearly three years, indicating the absence of a migrating plume. The low level of carbon tetrachloride seen in NLF-6 is most likely not associated with the landfill or its past operations.

At the suggestion of the Regional Water Quality Control Board, SNL evaluated the risk associated with the carbon tetrachloride observed in NLF-6. A risk assessment for the landfill was completed in 1997. The results indicated an extremely low risk, (approximately  $10^{-5}$  risk) to off-site populations, which falls within the U.S. Environmental Protection Agency's acceptable range of  $10^{-4}$  to  $10^{-6}$ . Regional Board staff found that the landfill does not pose a significant threat to the environment and approved closure of the site in March 1998.

#### A.4 REFERENCES

Ruderman, M., 1998, letter from Ruderman (San Francisco Bay Regional Water Quality Control Board) to M.J. Zamorski (U.S. Department of Energy, Oakland Operations Office), March 17.

Sandia National Laboratories, 1998, *Botanical and Wildlife Survey Report*, Sandia National Laboratories, Livermore, California, July.